AMENDMENTS TO THE CLAIMS

Please amend the claims without prejudice, without admission, without surrender of subject matter, and without any intention of creating any estoppel as to equivalents, as follows.

In the Claims:

1. (Withdrawn) A semiconductor device comprising:

a semiconductor substrate;

an interlayer insulating film formed on the semiconductor substrate, the interlayer insulating film comprising a first insulating film and a second insulating film formed on the first insulating film, the first insulating film comprising a silicon oxide film containing carbon of a concentration, the second insulating film comprising a silicon oxide film containing carbon of a concentration lower than the concentration of the first insulating film or comprising a silicon oxide film containing substantially no carbon,

a via contact made of a metal material embedded in a via hole formed in the interlayer insulating film, a diameter of the via hole in the first insulating film being smaller than that in the second insulating film at an interface between the first insulating film and the second insulating film.

2. (Withdrawn) The semiconductor device according to claim 1, in which a side surface of the second insulating film defines the via hole, and the side surface of the second insulating film is tapered.

3. (Withdrawn) The semiconductor device according to claim 1, in which a side surface of the first insulating film defines the via hole, and an edge portion of the side surface of the first insulating film, which is at an interface between the first insulating film and the second insulating film, is tapered.

4. (Withdrawn) The semiconductor device according to claim 2, in which a side surface of the first insulating film defines the via hole, and an edge portion of the side surface of the first insulating film, which is at an interface between the first insulating film and the second insulating film, is tapered.

5. (Withdrawn) The semiconductor device according to claim 1, in which a surface of the first insulating film defines the via hole, and the surface of the first insulating film is reverse-tapered.

6. (Withdrawn) The semiconductor device according to claim 2, in which a surface of the first insulating film defines the via hole, and the surface of the first insulating film is reverse-tapered.

7. (Withdrawn) The semiconductor device according to claim 1, in which a surface of the first insulating film defines the via hole, and the surface of the first insulating film is barrel-shaped.

8. (Withdrawn) The semiconductor device according to claim 2, in which a surface of the first insulating film defines the via hole, and the surface of the first insulating film is barrel-shaped.

9. (Previously presented) The semiconductor device according to claim 1, in which the via contact is provided in the via hole formed in the interlayer insulating film, with a barrier metal provided between the via contact and the interlayer insulating film, and

a difference in width between the first insulating film and the second insulating film at the interface between the first insulating film and the second insulating film is 2T or more, where T denotes a film thickness of the barrier film.

10. (Previously presented) A semiconductor device comprising:

a semiconductor substrate;

an interlayer insulating film formed on the semiconductor substrate, the interlayer insulating film comprising a first insulating film formed on the semiconductor substrate and a second insulating film formed on the first insulating film, the first insulating film containing carbon of a concentration, the second insulating film containing carbon of a concentration lower than the concentration of the first insulating film or containing substantially no carbon,

wherein a metal wiring of a metal material is embedded in a wiring groove formed in the interlayer insulating film, a width of the wiring groove in the first insulating film is smaller than that in the second insulating film at an interface between the first insulating film and the second insulating film, and

the width of the wiring groove in the first insulating film is substantially constant, and the width of the wiring groove in the second insulating film is substantially constant.

11. (Withdrawn) The semiconductor device according to claim 10, in which a side surface of the second insulating film defines the via hole, and the side surface of the second insulating film is tapered.

12. (Withdrawn) The semiconductor device according to claim 10, in which a side surface of the first insulating film defines the via hole, and an edge portion of the side surface of the first insulating film, which is at an interface between the first insulating film and the second insulating film, is tapered.

13. (Withdrawn) The semiconductor device according to claim 11, in which a side surface of the first insulating film defines the via hole, and an edge portion of the side surface of the first insulating film, which is at an interface between the first insulating film and the second insulating film, is tapered.

14. (Withdrawn) The semiconductor device according to claim 10, in which a surface of the first insulating film defines the via hole, and the surface of the first insulating film is reverse-tapered.

15. (Withdrawn) The semiconductor device according to claim 11, in which a surface of the first insulating film defines the via hole, and the surface of the first insulating film is reverse-tapered.

16. (Withdrawn) The semiconductor device according to claim 10, in which a surface of the first insulating film defines the via hole, and the surface of the first insulating film is barrel-shaped.

17. (Withdrawn) The semiconductor device according to claim 11, in which a surface of the first insulating film defines the via hole, and the surface of the first insulating film is barrel-shaped.

18. (Previously Presented) The semiconductor device according to claim 10, in which two or more of the metal wirings are provided in a side-by-side arrangement, and, when A denotes a width of the first insulating film between adjacent metal wirings, at the interface between the first insulating film and the second insulating film, in a direction of the side-by-side arrangement of the metal wirings, a difference in width between the first insulating layer and the second insulating film is A/2 or less.

19. (Previously Presented) The semiconductor device according to claim 10, in which the metal wiring is provided in the wiring groove, with an interlaid barrier metal, and

a difference in width between the first insulating film and the second insulating film, at the interface between the first insulating film and the second insulating film, is 2T or more, where T denotes a film thickness of the interlaid barrier metal.

20. (Previously presented) A method of manufacturing a semiconductor device comprising:

forming an interlayer insulating film on a semiconductor substrate, the interlayer insulating film comprising a first insulating film and a second insulating film formed on the first insulating film, the first insulating film comprising a silicon oxide film containing carbon of a concentration, the second insulating film comprising a silicon oxide film containing carbon of a concentration lower than the concentration of the first insulating film or comprising a silicon oxide film containing substantially no carbon,

forming a via hole in the interlayer insulating film,

removing a damaged layer formed on a side surface of the first insulating film which defines a portion of the via hole, the damaged layer being formed when the via hole is formed,

and retreating a side surface of the second insulating film which defines a portion of the via hole, and

embedding a metal material in the via hole to form a via contact in the via hole.

21. (Previously presented) A method of manufacturing a semiconductor device comprising:

forming an interlayer insulating film on a semiconductor substrate, the interlayer insulating film comprising a first insulating film and a second insulating film formed on the first insulating film, the first insulating film comprising a silicon oxide film containing carbon of a concentration, the second insulating film comprising a silicon oxide film containing carbon of a concentration lower than the concentration of the first insulating film or comprising a silicon oxide film containing substantially no carbon,

forming a wiring groove in the interlayer insulating film,

removing a damaged layer formed on a side surface of the first insulating film which defines a portion of the wiring groove, the damaged layer being formed when the wiring groove is formed, and retreating a side surface of the second insulating film which defines a portion of the wiring groove, and

embedding a metal material in the via hole to form a metal wiring in the wiring groove.

22. (Currently amended) A semiconductor device comprising:

a semiconductor substrate;

a first interlayer insulating layer formed on the semiconductor substrate, and having a first wiring formed on a surface of the first interlayer insulating layer;

a second interlayer insulating layer formed on the first interlayer insulating layer, and comprising a first insulating film and a second insulating film formed on the first insulating film, the first insulating film containing carbon of a concentration, the second insulating film containing carbon of a concentration lower than the concentration of the first insulating film or containing substantially no carbon; and

a via contact embedded in a via hole which extends through the ~~second~~ first interlayer insulating layer ~~film~~ and at least a portion of which is formed on the first wiring, and a second wiring embedded in a wiring groove which extends through the second and first insulating films ~~and which is formed on a surface of the second interlayer insulating film~~;

wherein a width of the second wiring groove in the first insulating film is smaller than that in the second insulating film at an interface between the first insulating film and the second insulating film,

the width of the second wiring groove in the first insulating film is substantially constant, and the width of the wiring groove in the second insulating film is substantially constant.

23. (Previously Presented) The semiconductor device according to claim 22, in which two or more of the second wirings are provided in a side-by-side arrangement, and, when A denotes a width of the first insulating film between adjacent second wirings, at the interface between the first insulating film and the second insulating film, in a direction of the side-by-side arrangement of the second wirings, a difference in width between the first insulating layer and the second insulating film, is A/2 or less.

24. (Previously Presented) The semiconductor device according to claim 22, in which the second wiring is embedded in the wiring groove with an interlaid barrier metal, and the via contact is embedded in the via hole with an interlaid barrier metal; and

a difference in width between the first insulating film and the second insulating film, at the interface between the first insulating film and the second insulating film, is 2T or more, where T denotes a film thickness of each of the interlaid barrier metals.

25. (Previously Presented) The semiconductor device according to claim 10, in which the first insulating film is made of methyl siloxane, SiOCH, SiOC, CF, or CN(H), and the second insulating film is made of SiO_2 or SiOCH, and low in carbon concentration.

26. (Previously Presented) The semiconductor device according to claim 22, in which the first insulating film is made of methyl siloxane, SiOCH, SiOC, CF, or CN(H), and the second insulating film is made of SiO_2 or SiOCH, and low in carbon concentration.

27. (Previously Presented) The semiconductor device according to claim 10, in which the metal wiring is made of Cu or Cu alloy.

28. (Previously Presented) The semiconductor device according to claim 22, in which the second wiring and the via contact are made of Cu or Cu alloy.

29. (Previously Presented) The semiconductor device according to claim 10, in which the first insulating film includes a silicon oxide film.

30. (Previously Presented) The semiconductor device according to claim 22, in which the first insulating film includes a silicon oxide film.